

Policy & Procedure (P&P)

Policy Title :

MASSIVE BLOOD TRANSFUSION

Department	Index No.	Scope
Laboratory & Blood Bank	LAB-117	All Blood Bank staff
Issue Date	Revision NO	Effective Date
1441/07/14	NEW	1441/07/14
Review Due Date	Related Standard NO.	Page Number#
1443/07/14	CBAHI (LB.66)	7

01. Policy:

- 1.1 It is the policy of Blood Bank to provide safe and quality blood products to massively bleeding patients.
- 1.2 Massive transfusion protocol is used to guide transfusion in emergency situation during critically bleeding patients.
- 1.3 The issued component should be with a ratio 1:1:1 and not more than 2:1:1 (Plasma: RBC: Platelets).

02. Definition :

- 2.1. **Blood Volume:** One blood volume is approximately 5000 mL or 70 mL/kg in a 70 kg adult
- 2.2. **Massive Transfusion:** Transfusion of a volume of blood components equivalent to a patient's estimated total blood volume within a 24 hour period, this approximates 10 units or more packed red blood cells in adults. Other definition as acute administration of 4 to 5 RBC units in 1 hour. In children, transfusion of >40 ml/kg (blood volume in children over 1 month old is approximately 80 ml/kg)
- 2.3. **Massive Transfusion Protocol (MTP):** A protocol developed to ensure rapid recognition, response, and intervention for those patients experiencing a massive transfusion event. A MTP is activated when the health care provider anticipates the hemorrhage event will require massive transfusion support.

03. Purpose :

- The purpose of this policy is to provide instructions to Blood Bank staff to issue blood products following proper criteria in massive transfusion event
- To provide appropriate guidelines in provision of blood components transfusion during the activation of MTP in massive transfusion event.

04. Procedure :

MASSIVE TRANSFUSION PROTOCOL:

4.1. Principle:

- 4.1.1. Massive transfusion protocol is used to guide transfusion in emergency situation during critically bleeding patients.
- 4.1.2. Hospital staff including physicians (as in ER, OR and ICU), nursing staff and blood bank staff should be aware of this protocol.
- 4.1.3. Massive transfusion protocol improves the outcomes of the massively bleeding patient through facilitate rapid communication, reduce delay in ordering and administering blood components and deliver a reasonable ratio of plasma and platelets to red blood cells (RBCs: FFP: Platelet).

4.2. Indications of massive transfusion:

- 4.2.1. Common causes of critical massive bleeding include sever trauma, gastrointestinal bleeding, ruptured aortic aneurysm, obstetric hemorrhage and surgical procedures.

4.3. Procedures:

4.3.1.

How the protocol is initiated?

- 4.3.1.1. MTP can be activated by an attending physician in any hospital location, most often from: Emergency Department (ER), Surgery (OR) and Critical Care Unit (ICU).
- 4.3.1.2. MTP is activated when it appears likely that the patient will require massive transfusion

4.3.2. Communication

- 4.3.2.1. The MTP is activated by phone call to the Blood Bank on 2242
- 4.3.2.2. It is important that the Blood Bank be notified of the patient's age, sex and patient history if any known pre-existing hematological disorder and amount of components needed for rapid preparation.

4.3.3. Blood product ordering:

- 4.3.3.1. The doctor who activates the protocol must send a completed stamped transfusion requisition, a stamped request for Uncrossmatched RBC if appropriate with a patient sample and a blood components transfusion cooler to the blood bank.
- 4.3.3.2. A trained transportation person a junior physician/or nurses goes to blood bank to deliver the blood requests and patient sample, and collect the first pack of blood components.
- 4.3.3.3. The optimum target ratio is difficult to determine. In patients with massive transfusion, a ratio of RBC:FFP:platelets of 1:1:1 but not more than 2:1:1 was associated with improved survival.
- 4.3.3.4. The type and number of blood products are released according to the physician's order.
- 4.3.3.5. Either uncrossmatched universally compatible PRBC units or type specific PRBCs will be issued according to physician's order and blood bank policy (LAB-83 Administration of blood during Emergency)
- 4.3.3.6. Blood bank staff immediately will prepare the required amount of FFP (AB plasma, rapidly thawed within 15 min).

pre transfusion compatibility tests will be completed urgently or as soon as blood specimen is provided for products issued without tests. In case of any discrepancy like antibody screen positive or incompatibility call the doctor and inform him.

- 4.3.3.7. results with released units; inform blood bank physician and treating physician immediately.
- 4.3.3.8. Subsequent requests for MT components should be made by calling blood bank and be accompanied by another blood component

emergency request.

4.3.3.9. As soon as the first MT pack has been dispensed, blood bank will prepare a second MT pack according to the previous physician request group specific or group compatible to the patient, in addition to ten cryoprecipitate units of any group.

4.3.3.10. Nursing staff will be responsible for maintaining accurate records of what blood products have been administered and how much.

4.3.3.11. Appropriate cardiovascular, electrolyte and coagulation parameters should be monitored closely throughout and following massive transfusion, to avoid over transfusion and hypocalcemia.

4.3.3.12. All blood components should be given via a rapid infuser/fluid warmer or other blood-warming device to prevent hypothermia

4.3.4. Deactivating the Massive Transfusion Protocol

4.3.4.1. It is crucial that the attending physician informs the Blood Bank when the MTP is over or when the patient is transferred.

4.3.4.2. Promptly return the unused blood components to the blood bank to avoid wastage of products

4.4. ONGOING MANAGEMENT DURING MASSIVE TRANSFUSION:

Patient Monitoring

4.4.1. Monitor vital signs and fluid status (continuous BP, HR, SPO2, RR, and all I&Os)

4.4.2. Laboratory testing prior to administering any blood components, collect blood samples (STAT) for CBC, INR, PTT, fibrinogen, electrolytes, ionized calcium, creatinine, acid-base status and samples for blood bank. Tests should be repeated every 30-60 minutes depending on the clinical condition.

4.4.3. Mortality is high in massive transfusion and its aetiology is multifactorial, which includes hypotension, acidosis, coagulopathy, shock and the underlying condition of the patient. The lethal triad patients with acidosis, hypothermia and coagulopathy have the highest mortality.

4.4.4. Monitor for signs of massive transfusion complications as Transfusion

associated circulatory overload, Respiratory distress and Citrate toxicity/hypocalcemia

4.5. Transfusion Management: These goals should be used as guidelines only and should not replace clinical judgment.

4.5.1. Transfuse plasma to maintain INR < 1.5 and/or aPTT < 1.5x upper limit of normal. Typical adult dose 10–15 mL/kg (3-4 units)

4.5.2. Transfuse cryoprecipitate (10 units) to maintain fibrinogen >1.0 g/L. Typical adult dose is 3-4 gm fibrinogen (8-10 Units)

4.5.3. Transfuse 1 adult dose of platelets to maintain platelet count > 50 x 10⁹/L or > 100 x 10⁹/L in those with multiple trauma, head/spinal injury or microvascular bleeding. Platelets may be indicated regardless of platelet count if platelet dysfunction is suspected (ex. post cardiopulmonary bypass or following ingestion of an antiplatelet agent)

4.5.4. Transfuse RBC to maintain hemoglobin >80g/L.

4.6. Supportive Measures:

4.6.1. Attempt to achieve local hemostasis (e.g. via angiography or surgery).

4.6.2. Consider cell salvage if cell saver available (Use only if blood loss is from a clean surgical field in a patient without underlying malignancy or current systemic infection).

4.6.3. Administer TXA 1 g in 50 cc 0.9% NaCl solution over 10 minutes (except if evidence of DIC or bleeding from urinary tract). Maintenance dose of 1 g should be started right after the loading dose and infused over 8hrs.

4.6.4. Prevent hypothermia. Aim for core temperature >35°C. Use a Level One Rapid Infuser with blood warmer where possible, administer all IV fluids via blood warmer, and consider methods of passive or active warming for all MTP patients.

4.6.5. Prevent/correct acidosis by resuscitation with IV fluids, blood components and bicarbonate solution if indicated; aim for pH in the normal range.

4.6.6. Maintain normal calcium levels by administering IV calcium salts.

4.6.7. If the patient is on any anticoagulant or antiplatelet agents, consult Hematology or Transfusion Medicine for specific management.

05. Responsibilities :

All Blood Bank staff of Al-Qunfudah General Hospital.

All medical staff of Al-Qunfudah General Hospital.

06. Equipment & Forms

06.1. Crossmatching request Form.

06.2. Crossmatching Records.

07. Attachment :

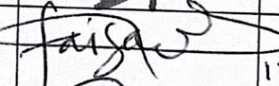
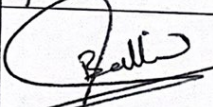
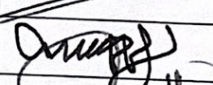
LAB-83 Administration of blood during Emergency

08. Reference

Patient Blood Management Guidelines: Module 1 – Critical bleeding/massive transfusion. National Blood Authority, Canberra, Australia, 2012.

Technical Manual, American Association of Blood Banks (AABB), 18th edition, 2014

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